

Remarks

This amendment, which accompanies a request for continued examination (RCE), is a replacement for the amendment under 37 CFR 1.116 filed January 19, 2004, and assumes that that earlier amendment has not been entered.

In this amendment, the specification has been corrected on page 26 so that the "C" in "C_{uncapped}" on line 7 does not read as part of the subscript. Also, claims 1-3 have been cancelled.

The following remarks are directed to specific groups of claims remaining in the application.

Claims 4-15

Claims 4 and 12 have been amended to change "including" in the transition phrase to "comprising" to accord with the language in the other independent claims. No substantive change is intended.

Claims 4 and 12 have also been amended to recite that each logical partition has "one or more applications executing therein" (page 9, lines 15-17) and that, if the actual consumption of resources by the logical partition exceeds the maximum allowed consumption, the actual consumption is reduced to the maximum allowed consumption "by reducing the defined portion of machine resources allocated to said logical partition while allowing all¹ of the one or more software applications executing in said logical partition to continue executing". This reduction of the defined portion of machine resources allocated to the logical partition may be accomplished by such methods as the capping method described in the specification.

With this amendment, claims 4 and 12 and the claims dependent thereon clearly distinguish over the Breddan and Beelitz references cited by the Examiner.

¹ The two words "all of" in claims 4 and 12 and the corresponding remarks are what distinguish this amendment from the previously filed amendment under 37 CFR 1.116. In an actual system, of course, an originally executing application might terminate for some other reason (programming error, user command, etc.), but not because it was not allowed to continue to run.

The Examiner contends that Breddan “clearly teaches a threshold for consumption”, citing col. 1, lines 10-15, and col. 4, lines 24-30, of the reference (page 7, ¶ 26). However, while Breddan ~~does~~ teach the notion of a maximum allowed consumption, it is in what happens when that maximum is exceeded where Breddan falls short as a reference. In contrast to applicants’ claimed invention, in which all of the applications 114² in a logical partition 108 (Fig. 1) are allowed to continue to execute, Breddan simply sheds loads L1, L2, . . . , Lk (Fig. 1) as required to achieve consumption goals. While this may be an acceptable way of managing an overall HVAC load, it would be an unacceptable approach in a system relying on the continuous availability of a software application. Furthermore, Breddan’s approach may not necessarily be effective to reduce resource consumption in a partition, since the machine resources used by a terminated application may remain available to the operating system and any other applications running in that partition.³

Thus, even if Beelitz were modified in view of Breddan as suggested by the Examiner, the resulting system would not reduce actual consumption of resources within a partition to a maximum allowed consumption by reducing the portion of resources allocated to the partition, as claimed by applicants. Nor would Beelitz do so while allowing all of the applications executing in the partition to continue executing, as further claimed by applicants. Rather, the resulting system would manage resource consumption in a logical partition by terminating applications running in that partition. Accordingly, claims 4-15 as amended distinguish patentably over the combination of these two references.

Claims 16-24

Claims 16 and 21, upon which the remaining claims of this group depend, recite that if the actual average consumption (C_{avg}) of resources by a logical partition exceeds a maximum average

² This is the proper analogy, between applicants’ applications and Breddan’s loads and between applicants’ logical partition and Breddan’s facility. Applicants are specifying a maximum allowed consumption for a particular partition (and not individual applications within that partition), while Breddan is attempting to control consumption within a particular facility (and not individual loads within that facility).

³ By contrast, since the loads in Breddan are in connected in parallel across the voltage source, taking an individual load offline will have the effect of reducing overall power consumption.

consumption (C_{softcap}), the actual average consumption is reduced to the maximum average consumption by alternately operating the logical partition in a capped mode in which the logical partition is limited to a maximum capped consumption (C_{capped}) and in an uncapped mode in which the logical partition is not limited to the maximum capped consumption. By operating in this fashion, applicants' system can effectively manage the average resource consumption of a logical partition over a wide range of "soft" caps (C_{softcap}) merely by altering the relative time intervals over which the logical partition is operated in the capped and uncapped modes. Capping is applied and removed in an alternating fashion so that work in the logical partition never comes to a complete halt (page 8, lines 5-7).

The Examiner asserts that Breddan teaches such alternating modes of operation (pages 5-6, ¶ 17). However, the only alternation discernible in this reference is between operation with a particular load shed (i.e., offline) and operation with that load online. This is not an alternation, though, between a "capped" mode and an "uncapped" mode as claimed by applicants. In neither of these modes of operation is the facility being controlled "capped" to any particular level of resource consumption. Rather, in either mode, the total electrical load (the counterpart of applicants' actual average consumption) is simply the sum of the individual loads attributable to the devices on line. If this total load is too much, additional devices are taken offline. If the total load is below the set limit by more than a certain amount, additional devices are brought back online.

In summary, Breddan does not teach alternately operating a facility in a capped mode in which the facility is limited to a maximum capped consumption and in an uncapped mode in which the facility is not limited to the maximum capped consumption. Thus, even if Breddan were combined with Beelitz in the manner suggested by the Examiner, so that the facility being controlled is a logical partition, such a logical partition would not operate in the manner claimed by applicants.

Claims 8 and 25-27

Each of these claims has been amended to recite that a partition's "phantom weight" is added to the sum of the weights of the logical partitions in the its group (i.e., the denominator in the first

formula on page 25), but not to “the weight of said logical partition” (i.e., the numerator in that formula) in determining the ratio of the weight of the logical partition to the sum of the weights of the logical partitions in its group. While this notion is believed to have been implicit in the claims as previously presented, this amendment makes it explicit.

As so amended, each of these claims recites that the logical partition is one of a group of partitions, each of which is assigned a weight, that the maximum allowed (claim 8) or capped (claims 25-27) consumption is specified as a proportion of the resources available to the group of partitions, and that the proportion is defined as the ratio of the weight of the logical partition to the sum of the weights of the partitions in the group. Additionally, the logical partition is assigned a phantom weight that is added to the sum of the weights of the logical partitions in the group but not to the weight of the partition itself in determining that ratio. As previously noted, this phantom weight allows the disclosed capacity management scheme to be used with a logical partition that is the only partition in a group or whose capped capacity already exceeds the target capacity to which it is managed.

Again, nothing in the art cited by the Examiner suggests this feature of applicants' claimed invention. The Examiner takes official notice in paragraph 17 of the action that uses of weights within partitions are “well known in the art”. However, the Examiner points to nothing in the art that would suggest applicants' notion of also assigning to a partition a phantom weight, which is added to the sum of the partition weights but not to the weight of the partition itself to determine the ratio of the partition weight to the total weight. Accordingly, claims 8 and 25-27 likewise distinguish patentably over the art cited by the Examiner.⁴

⁴ Claim 8, being dependent on claim 4, also distinguishes patentably over such art for the reasons urged above with respect to claims 4-15.

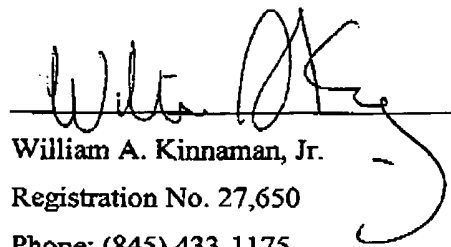
Conclusion

For the foregoing reasons, claims 4-27 as amended are believed to distinguish patentably over the art cited by the Examiner. Entry of this amendment and reconsideration of the application as amended are respectfully requested. It is hoped that upon such consideration the Examiner will hold all claims allowable and pass the case to issue at an early date. Such action is earnestly solicited.

Respectfully submitted,

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